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Multiple Award, Multiple Order Contracts—the Future of Navy Surface Maintenance Procurement

27 May 2015

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Abstract

Prior to 2004, all Chief of Naval Operations maintenance availabilities used a firm-fixed price contract structure. These contracts resulted in significant cost overruns and schedule delays, and did not create the collaborative environment the Navy desired. In an effort to improve outcomes, Naval Sea Systems Command (NAVSEA) created the Multi-ship, Multi-option contract, a long-term, cost-reimbursement contracting vehicle that was competitively awarded.

In 2013, NAVSEA determined that although collaboration and ownership had improved, the Navy's ability to manage growth had been underestimated. Commander, Navy Regional Maintenance Centers and NAVSEA 21 set out to create a contracting vehicle with firm-fixed price or fixed price award fee competitions via multiple award contracts and created the Multiple Award Contract–Multiple Order (MAC-MO) contract strategy. The purpose of this MBA project is to analyze MAC-MO contracts and compare/contrast them with previous strategies in order to determine the efficiency and effectiveness of this method.

Keywords: Contracting, contract strategy, maintenance procurement, multiple award contract, requirement definition, contract incentives

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About the Authors

LT Matthew Duncan is a graduate student studying Acquisition and Contract Management at the Graduate School of Business and Public Policy, Naval Postgraduate School.

A native of Fort Mitchell, KY, he was commissioned via the Officer Candidate School in August 2005. He earned a Bachelor of Business Administration degree in Finance from the University of Kentucky in 2004.

Afloat, LT Duncan has served as Supply Officer in USS BARRY (DDG 52) in Norfolk, VA, from July 2011 to October 2013 and as Disbursing/Sales and Food Service Officer in USS LAKE ERIE (CG 70) in Pearl Harbor, HI, from March 2006 to July 2008. His sea experience includes a 2007 Western Pacific deployment and a 2013 Mediterranean Sea deployment, both in support of Ballistic Missile Defense.

His shore assignments include duties as a Business and Financial Management Intern at the Joint Strike Fighter, F-35 Lightning II, Joint Program Office in Arlington, VA from April 2009 to May 2011; and a Global War on Terrorism Support Assignment (GSA) to the Combined Joint Task Force 101 Headquarters at Bagram Air Field, Afghanistan.

LT Duncan's personal awards include the Joint Commendation Medal (two awards), the Navy & Marine Corps Commendation Medal (two awards), the Navy & Marine Corps Achievement Medal and a number of unit and campaign awards. He is a qualified Surface Warfare Supply Corps Officer.

LT Duncan met his wife, Lauren, in Athens, GA. They reside in Monterey, CA, with their children Parker, Caroline, Everly and Nolan.

LCDR Richard Hartl, a native of Billings, Montana, graduated from Billings West High School in 1990 and received a Bachelor of Science Business Administration/Finance degree from Montana State University – Billings in May, 1996. He worked in the commercial banking industry as a commercial and agri-business lender for eight years and was commissioned an Ensign in the U. S Navy through the Officer Candidate Program on October 8, 2004.

Lieutenant Commander Hartl completed the Supply Officer Basic Qualification Course in May 2005 and the Supply Officer Department Head Course in May 2011.

In preparation for his first operational tour, Lieutenant Hartl completed the Submarine Officer Basic Course in October 2005 and reported to the USS CONNECTICUT (SSN 22) and the Naval Submarine Support Center in Groton, Connecticut. In May 2006, he was transferred to the USS SAN JUAN (SSN 751) as the Supply Officer, detaching in March 2008. His next tour was as Operations Officer and Budget Officer for Fleet Logistics Center Sigonella – Rota, Spain from April 2008 to April 2011. Returning stateside, he reported as Supply Officer onboard the USS RODNEY M DAVIS (FFG 60) from June 2011 to November 2013, earning the Supply Blue "E" for logistics excellence.

Lieutenant Commander Hartl is qualified as Submarine Warfare Supply Corps Officer and Surface Warfare Supply Corps Officer. He has been awarded the Navy Commendation Medal, the Navy Achievement Medal and Battle Efficiency Award.

Lieutenant Commander Hartl is married to Brianna Hutchison of Billings, Montana. They have three daughters, Bailey (12), Amelia (9), and Callan (2).

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List of Acronyms and Abbreviations

AQWP	actual quantity of work performed
ASN(FM&C)	Assistant Secretary of the Navy, Financial Management and Comptroller
BQWP	budgeted quantity of work performed
CPARS	Contractor Performance Appraisal Report System
CMAV	continuous maintenance availability
CNO	Chief of Naval Operations
CNRMC	Commander, Navy Regional Maintenance Center
CNSF	Commander, Naval Surface Forces
CPAF	cost plus award fee
CPIF	cost plus incentive fee
DASN(AP)	Deputy Assistant Secretary of the Navy for Acquisition and Procurement
DDG	guided missile destroyer
DHS	Department of Homeland Security
DOD	Department of Defense
DODFMR	Department of Defense Financial Management Regulation
DOD IG	Department of Defense Inspector General
DON	Department of the Navy
EVM	Earned Value Management
FAR	Federal Acquisition Regulation
FASA	Federal Acquisition Streamlining Act
FFG	guided missile frigate
FFP	firm-fixed price
FLTCDR	fleet commander
FPAF	fixed price award fee
FRP	Fleet Response Plan
GAO	Government Accountability Office

IF	incentive fee
JFMM	Joint Fleet Maintenance Manual
LOD	lost operational days
LCS	littoral combat ship
LHD	landing ship, dock
LPTA	lowest price technically acceptable
LSI	Lead Systems Integrator
MAC	multiple award contracts
MAC-MO	Multiple Award Contract–Multiple Order
MMPR	Maintenance and Modernization Performance Review
MSC	Master Specification Catalog
MSMO	multi-ship, multi-option
NAVSEA	Naval Sea Systems Command
NDE	Navy Data Environment
O&MN	operation and maintenance Navy
OFPP	Office of Federal Procurement Policy
OFRP	Operational Fleet Readiness Plan
OMB	Office of Management and Budget
OUSD(AT&L)	Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics
OTA	on time award
PEO	Program Executive Officer
PM	Program Manager
RCC	request for contract change
RFP	request for proposal
SASC	Senate Armed Services Committee
SOW	statement of work
SRA	selected restricted availability
SURFMEPP	Surface Engineering Maintenance Planning Program
SWRMC	Southwest Regional Maintenance Center

USFF	United States Fleet Forces Command
WPER	Work Package Execution Review

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I. INTRODUCTION

A. PURPOSE

The Navy expended over $7.6 billion on surface ship maintenance contracts in fiscal year (FY) 2014 (Department of the Navy [DON], 2015, p. 120). To put this in perspective, that amount is approximately 17% of the Navy's operation and maintenance (O&MN) budget (DON, 2015, p. 17) and nearly $1 billion greater than the Coast Guard's entire operating expense account for FY 2014 (Department of Homeland Security [DHS], 2013, p. 144).

Clearly, the Navy's maintenance budget is quite large and requires a very high level of contract management. It is critical that the Navy employ the appropriate contract strategy in order to minimize cost overruns, maintain schedule, and ensure the highest quality of repairs for the fleet. This project looks into historical fleet maintenance contracting strategies and their evolution to current day practices.

Prior to 2004, all Chief of Naval Operations (CNO) maintenance availabilities used a single ship, firm-fixed price contract structure. This essentially means that a maintenance contract was written on an individual basis for each ship, limiting the amount of available funding to conduct the scheduled maintenance. According to NAVSEA, this contract structure led to the following results:

- excessive cost growth with variation in final contract cost
- Navy–industry relationships that were contentious vice collaborative and had opposing objectives
- no ownership of Navy objectives by the contractor (McManamon, 2009, slide 4)

In an attempt to improve the maintenance procurement strategy for the CNO availabilities of surface ships, Naval Sea Systems Command (NAVSEA) and Commander, Naval Surface Forces (CNSF) consulted with commercial ship-line operators to create the Multi-Ship, Multi-Option (MSMO) maintenance strategy. MSMO was a competitively awarded, long-term, cost-reimbursement contracting vehicle. Admiral Robert Natter, former commander, U.S. Atlantic Fleet, stated that

> multi-option, multi-ship contracting [would] mean a better end product for all of our ships going into the yards for repairs. … This form of contracting [would] enable us to more efficiently and effectively manage ships' maintenance schedules, which [meant] improved readiness for operations. (Nagle, 2002, para. 6)

As the primary maintenance procurement method for Navy surface ships from 2004 to 2013, the MSMO strategy had several objectives:

1. Support Fleet Readiness Plan (FRP) with improved maintenance readiness
   a. Long-term and accountable relationship
   b. Industrial base that is steady, flexible, and quick to react

2. Develop a partnership mentality with contractor where the Navy is the primary customer
   a. Contractor allegiance with the customer

3. Provide a predictable workload forecast
   a. Contractor investment in workforce and modernization of facilities (McManamon, 2009, p. 5)

The basic structure of the MSMO contract was a single, long-term (five-year) contract that provided for maintenance and modernization services by ship class and homeport. A total of 20 MSMO contracts were awarded between FY 2004 and FY 2009 at a total volume of $4.3 billion. The contracts used a cost-reimbursement strategy with an award fee incentive structure. In short, the contractors were reimbursed for all allocable, allowable, and reasonable costs expended, and were provided an opportunity to earn an extra fee for superb technical performance and superb management of the maintenance process. Fees were capped at 11.2%, and the average fee earned was approximately 9.5%. The contractor fee was considered at risk, or was not guaranteed to be paid by the government, and the fee payout was based on the Navy's assessment of the contractor's management system and technical performance.

In 2013, NAVSEA determined that although collaboration and ownership had improved, the Navy had "significantly underestimated their ability to manage growth" (p. 4) and the level of required "government resources and effort to effectively administer contracts and remain a smart buyer and peer of industry" (p. 4). Cost-reimbursement contracts require close management to ensure efficiency and avoid steeply escalating costs, and the Navy did not have the necessary resources to properly administer the MSMO contracts.

Once again, in an attempt to improve the maintenance procurement strategy for the surface maintenance, Commander, Navy Regional Maintenance Centers (CNRMC) and NAVSEA set out to create another contracting vehicle, this time with firm-fixed price (FFP) or fixed price award fee (FPAF) competitions via multiple award contracts. The result of these efforts was the development of the Multiple Award Contract-Multiple Order (MAC-MO) contract strategy. The desire was to

maintain the same Navy-industry collaboration objectives as the MSMO strategy while simultaneously controlling costs and leveraging the Navy's limited contract administration resources.

The basic structure of the MAC-MO contract is to compete and award multiple award contracts to qualified ship repair yards. Each CNO availability/Continuous Maintenance Availability (CMAV) is competed among multiple award contract (MAC) holders on the basis of past performance and proposed price. FFP and FPAF contracts are awarded for routine maintenance. The MAC-MO strategy also allows for the award of separate cost plus award fee (CPAF) contracts for non-routine, emergent maintenance and a CPAF/incentive fee (IF) contract for maintenance planning accomplished by a third party.

B. PROBLEM STATEMENT

In the National Defense Authorization Act of 2009, the Senate Armed Services Committee (SASC) stated that the Navy had not established measures of effectiveness and appropriate cost control mechanisms to maximize the benefits promised by MSMO contract strategies.

In response to the SASC statement and other executive leaders' demands for improved maintenance, the Navy developed the MAC-MO contract strategy. MAC-MO successes and/or failures have not been identified, and therefore it is not known whether MAC-MO contracts are more effective and/or more efficient than their FFP or MSMO predecessors. In short, the researchers seek to understand whether or not MAC-MO contracts provide the best value for surface ship maintenance for the Navy and the government.

C. RESEARCH QUESTIONS

The researchers used the following questions to guide the research and analysis:

- Are MAC-MO contracts the most efficient and effective contracting method for CNO availabilities?
- Are MAC-MO contracts meeting their objectives?
- Are there any best practices from past successful MAC-MO contracts?

D. SCOPE OF THESIS

This MBA project presents results from appropriate and relevant data, specifically information from ongoing and completed MAC-MO contracts. These data include cost, schedule performance, and lost operational days associated with each MAC-MO contract. Using these data, the researchers assess the effectiveness and efficiency of the MAC-MO strategy.

The data were collected and analyzed to determine (a) if the objectives of the MAC-MO contract were met, and (b) if the MAC-MO strategy has improved effectiveness and efficiency of CNO maintenance contract procurement, as compared to the previous MSMO strategy. As a result of this research, Navy leadership will be able to (a) better understand the evolution of the Navy's maintenance contracting strategies, (b) apply the lessons learned to future MAC-MO availabilities, and (c) perhaps aid in the strategy development of future Navy maintenance contracts.

II. LITERATURE REVIEW AND BACKGROUND INFORMATION

A literature review was conducted to better understand the Navy's maintenance policy and previous ship maintenance contracting strategies, to include actual and expected outcomes of ship maintenance availabilities. This background information was used to develop a set of analytical tools necessary to study the MAC-MO contract.

A. MAINTENANCE POLICY

A ship maintenance policy ensures that the Navy has capable and effective tools to protect the freedoms and execute the policies of the United States. The Navy's maintenance program consists of two components to maintain the readiness of the fleet: ship maintenance and ship modernization. The budgets for each of the components are distinct from each other, but are closely related in terms of planning and execution. The *Maintenance Policy for the United States Navy Ships,* OPNAVINST 4700.7L, outlines the following as the scope of the maintenance program:

- Ship maintenance procedures and policies are designed to ensure the safety of the crew and the ship while achieving the desired operational readiness levels at the lowest possible total ownership cost, consistent with public law and other directives.
- The ship modernization program is designed to increase ship system capability and/or improve the reliability and maintainability of existing systems. Maintaining the integrity of the ship class configuration is also a requirement. (Office of the Chief of Naval Operations [OPNAV], 2010, p. 2)

This research focuses on MAC-MO contracts for depot-level maintenance availabilities. These maintenance periods are synonymous with CNO-scheduled depot availabilities, which require facilities, capabilities, or capacities that are beyond the shipboard and intermediate level. Depot-level maintenance can be comprised of, but is not limited to, both organizational and intermediate-level maintenance, as well as repair and modernization of the ship's weapon systems, engineering and propulsion plants, auxiliary plants, and structural repairs. CNO availabilities can be performed in naval shipyards or private shipyards and are comprised of a mix of government agents, original equipment representatives, and contracted labor.

There are numerous types of CNO availabilities, and the *Joint Fleet Maintenance Manual* (*JFMM*) breaks them into two categories based on duration:

1. CNO scheduled maintenance availabilities greater than six months in duration are:
   a. Overhaul—An availability scheduled for accomplishment of industrial maintenance and modernization. Types of availabilities include:

      i. Regular Overhaul
      ii. Complex Overhaul
      iii. Engineered Overhaul
      iv. Refueling Overhaul
      v. Refueling Complex Overhaul
      vi. Engineered Refueling Overhaul

   b. Other availabilities—An availability scheduled primarily for industrial maintenance and installation of major, high priority alterations. Types of these availabilities include:

      i. Depot Maintenance Period
      ii. Planned Incremental Availability
      iii. Docking Planned Incremental Availability
      iv. Extended Drydocking Phase Maintenance Availability
      v. Post Shakedown Availability
      vi. Carrier Incremental Availability

2. CNO scheduled maintenance availabilities less than six months in duration include short, labor-intensive availabilities scheduled for accomplishment of industrial maintenance and modernization. These types of availabilities include:
   a. Selected Restricted Availability (SRA)
   b. Docking SRA
   c. Phased Maintenance Availability
   d. Docking Phased Maintenance Availability
   e. Service Craft Overhaul
   f. Extended SRA
   g. Extended Docking SRA
   h. Incremental SRA
   i. Extended Refit Period
   j. Post Shakedown Availability
   k. Pre-Inactivation Restricted Availability

   (Commander, U.S. Fleet Forces Command [CFFC], 2013, p. II-I-3-4)

A CNO availability is also comprised of multiple command and supporting organizations. The various entities each play a role in ensuring that the planning and execution of the depot-level maintenance period is successful. The following is a list of the key stakeholders and their major responsibilities:

- CNO—Approve maintenance program master plans and monitor compliance. OPNAV staff documents availability durations, intervals, and repair man-days and controls schedule of CNO-scheduled availabilities.
- Fleet Commanders (FLTCDR)—Coordinate required depot maintenance and operational requirements and monitor maintenance execution and ensure cost, schedule, and performance measures are achieved.
- Naval Sea Systems Command (NAVSEA)—Serves as the lead technical authority, establishes performance standards for maintenance and/or modernization, and ensures agencies execute within the scope of work authorized.
- Program Executive Office (PEO)/Project Manager (PM)—Determine realistic availability milestones that increase the likelihood of successful completion.
- Executing Command and Contractor—Perform and monitor maintenance actions during the availability (OPNAV, 2010, pp. 12–20).

B. FIRM-FIXED PRICE CONTRACTS

Contractors are a major element of successful ship maintenance, and the strategy used to procure their labor plays a critical role in the overall maintenance outcome. The initial surface ship maintenance agreement was a firm-fixed price (FFP) contract, which provided for little flexibility with regard to the contract's final cost.

1. Contract Strategy

Prior to 2004, FFP contracts were the primary contracting vehicle for CNO availabilities. The Federal Acquisition Regulation (FAR, 2015) defines FFP contracts as follows:

> A firm-fixed-price contract provides for a price that is not subject to any adjustment on the basis of the contractor's cost experience in performing the contract. This contract type places upon the contractor maximum risk and full responsibility for all costs and resulting profit or loss. It provides maximum incentive for the contractor to control costs

> and perform effectively and imposes a minimum administrative burden upon the contracting parties. (FAR 16.202-1)

Essentially, FFP contracts set a price limit that the contractor is not to exceed. While the intent is to protect the Government from major cost overruns, FFP contracts are not effective for all types of requirements, particularly those that are not well defined.

Congress and Department of Defense (DOD) leaders have instituted several laws and regulations either promoting or requiring the use of FFP contracts. A brief chronology of major legislation is as follows:

- May 1985—The CNO directed that fixed-price contracts will be used for ship maintenance (Government Accountability Office [GAO], 1986, p. 4).
- February 2009—The American Recovery and Reinvestment Act of 2009 required maximum use of fixed-price contracts (American Recovery and Reinvestment Act, 2009, § 1554).
- March 2009—President Obama issued a memorandum that discussed the risk of cost-reimbursement contracts and advocated preference for fixed-price contracts (Obama, 2009, pp. 9755–9757).
- October 2009—The National Defense Authorization Act for FY 2010 expressed that the Navy could more efficiently maintain its ships through fixed-price contracts (National Defense Authorization Act, 2010, § 1021).

These statutes and regulations, in addition to the inherent low risk to the government associated with FFP contracts, were the driving forces behind the utilization of FFP contracts in surface ship maintenance.

2. Incentive Structure

The biggest advantages of FFP contracts are the allocation of risk and cost-efficiency. Under an FFP contract, the contractor bears all of the risk of a cost overrun, and the government pays a firm, set price. FFP contracts are best suited for projects with well-defined requirements and experienced contractors. The biggest disadvantage is that the contractor is incentivized to perform exactly as the contract states, with no additional motivation to decrease schedule or increase technical performance. A contractor working under an FFP contract is motivated to decrease costs, as lower costs result in higher profit (i.e., whatever funding is not used in performance of the contract is the contractor's to keep).

Although the incentive structure of an FFP contract is designed to give the government specifically what it requires for a specified price, in the case of CNO availability contracts, the final outcome of completed maintenance availabilities were not as expected. Allowing for very little scope flexibility, the FFP contract structure resulted in adverse outcomes when additional maintenance needs were discovered.

3. Outcomes in Ship Maintenance

FFP contracts for Navy ship maintenance received criticism from Navy military and civilian leadership in 2004 (McManamon, 2009, p. 4). The single-use, FFP contracts generally led to undesirable outcomes, including

- excessive cost growth with variation in final contract cost
- Navy–industry relationships that were contentious vice collaborative (as a result of having opposing objectives)
- no ownership by the contractor of Navy objectives (McManamon, 2009, p. 4)

a. Cost Growth

There are several reasons for cost growth in Navy maintenance contracts, three of which are primarily mentioned in MSMO concept material. The first is a lack of well-defined requirements, the second is an increase in schedule, and the third is a lack of skilled workers and the learning-curve impact.

1. Requirements Definition

Well-defined requirements are essential in FFP contracts. When requirements are not well defined, FFP contracts are frequently modified to account for additional work. In their article, “The Importance of Contract Design,” Brown and Kim (2012) analyzed DOD fixed-price contracts and found that the DOD would “often dramatically increase the length and value of contracts through modifications to initial agreements. This approach forgoes the benefits of competition and exposed the agency to the risk of cost overruns, delivery delays, and diminished product quality” (p. 687).

Poorly defined requirements—requirements that truly could not be defined beforehand—led to growth and new work in Navy maintenance contracts. CNRMC defined *growth work* “as any additional work that is identified or authorized after contract definitization that is related to a work item included in the original contract definitization” (CNRMC, 2012, p. 1). For instance, if cracks or holes were discovered inside a ship’s fuel tank during shipyard corrosion control activities (e.g., grinding and/or sanding) and there was already a work item in the contract for crack or hole repair, then the requirement would be considered growth work. CNRMC’s

definition of new work is similar to growth work except that the work is not related to items in the original contract. An example of new work is adding fuel tank repair to a combat systems equipment-specific maintenance availability.

Prior to 2008, to cover unexpected growth work, the Navy would add a growth pool value to the total contract value (DOD Inspector General [DOD IG], 2008, p. 6). Once the growth work was identified, a contract modification would be issued and the growth pool money would be obligated. In April 2008, the DOD IG report noted that 125 growth pool modifications were issued for a value of over $39 million, and a significant amount was obligated prior to a modification being issued (DOD IG, 2008, p. 6). The DOD IG also found that using growth pools violated 31 U.S.C. 1501; the *DOD Financial Management Regulation (FMR)*, Volume 3, Chapter 8; 31 U.S.C. 1502; and the *Joint Fleet Maintenance Manual* (*JFMM*) because growth work was not associated with contract work items or tasks. Due to these findings, the Assistant Secretary of the Navy, Financial Management and Comptroller (ASN[FM&C]) discontinued the use of growth pools and required that negotiated contract modifications be issued upon identification of growth work (DOD IG, 2008, p. 10).

Regardless of the ASN(FM&C)'s decision to eliminate growth pools, growth work and new work continue to drive cost overruns in Navy maintenance availabilities.

2. Schedule Overruns

The second major cost driver is schedule overruns. In a study by Caprio and Leszczynski (2012) of aircraft carrier; attack submarine; and landing ship, dock (LHD) 1 class ships maintenance availabilities at the four public naval shipyards, it was found that between FY 2005 and FY 2011, only 10% to 45%, depending on the fiscal year reviewed, of 108 ships were completed on time (p. 1).

Caprio and Leszczynski (2012) also found that schedule issues led to lower cost performance ratios. In their study, they measured performance by dividing the budgeted quantity of work performed (BQWP) by the actual quantity of work performed (AQWP). The cost performance was determined to be successful if the ratio was .95 or higher. In their report, they found that late availabilities had a cost performance ratio of .87 (Caprio & Leszczynski, 2012, p. 78).

3. Labor Implications

Another significant cost-driver for ship maintenance is the workforce. FFP contracts were typically less than a year in duration, providing no long-term stability for the labor force and creating lull time that negatively impacted the maintenance learning curve. The lack of stability made it difficult for shipyards to maintain competent personnel and created a reliance on temporary labor to

supplement the workforce during increases in workload (GAO, 2011, p. 13). These temporary laborers increased the learning curve, thus adding time to the schedule and decreasing performance, ultimately negatively impacting overall contract price. The issues with shipyard labor also created long-term impacts to ship maintenance by decreasing improvement and innovation of maintenance techniques and processes (NAVSEA 21, 2008, slide 7).

b. Navy Industry Relationships

In 2009, NAVSEA 21 Commander, Rear Admiral James McManamon, called the relationship between the Navy and the ship maintenance industry "contentious," and stated that contractors had a "bid low, grow hard" mentality (McManamon, 2009, slide 4). The single-use FFP contracts provided no incentive to the maintenance community to perform at a high standard. The FFP's total cost was already determined, and while the government maintained the goal of high quality performance, the contractor's goal was to minimize costs in order to collect more profit. These misaligned goals compounded an already complex maintenance overhaul process.

c. Contractor Ownership

Under the FFP contracts, the Navy took the lead for CNO availability planning, and the shipyards executed the plan. This setup allowed the contractor to work with an "execution only" mindset, removing the contractor from any ownership of, or insight into, the overall maintenance plan, as well as any problems that arose throughout the availability. The Navy needed a contract strategy in which the contractor owned the process from planning to execution, a strategy that would lead to better results for both parties (McManamon, 2009, slide 6). Hence, the Navy's MSMO contract strategy was introduced.

C. MULTI-SHIP, MULTI-OPTION CONTRACTS

1. Contract Strategy

In 2004, CNSF was dissatisfied with surface ship maintenance and called upon NAVSEA to search for improvements in execution. NAVSEA consulted with commercial ship lines and shipyards to draw on best practices and lessons learned that could be applied to Navy maintenance (McManamon, 2009, slide 4).

What NAVSEA found was that commercial ship lines use multiple-ship award and incentive contracts to maintain their fleets. For example, in October 2004, Australia's North West Shelf Shipping signed a long-term maintenance and upgrade contract for its fleet of liquefied natural gas ships with Singapore's SembCorp Marine. The five-year contract provided drydocking and other maintenance services

for NWS's nine-ship fleet at SembCorp Marine's Sembawang and Jurong shipyards (Sembawang Shipyard, 2004, pp. 1–3).

Another example of commercial ship line contracting strategies comes from the A.P. Moller-Maersk Group, also known as Maersk, which is the largest commercial shipping company in the world (Caulderwood, 2014, para. 1). With over 500 ships in its fleet, maintenance costs are substantial. Maersk uses multiple-ship contracts to reduce costs and increase efficiency. As a worldwide shipping company, it groups ships by their areas of operation and combines them all into a single repair or overhaul contract (Maersk Line, Limited, 2014, Government Ship Management section, para. 7). This contractual setup allows for increased competition and incentivizes the winning contractor to perform at the highest standards and lowest costs, particularly when the contractor's receipt of future contracts is based on previous performance.

Unlike the FFP contract structure that offered no incentives for the contractor to provide high quality service, the MSMO strategy used a cost-reimbursement contract with incentives to encourage the contractors to keep costs as low as possible while still providing high quality ship maintenance.

2. Cost-Reimbursement Contracts

The Navy has a variety of contract types to choose from when procuring ship maintenance. For the MSMO strategy, the Navy chose to use a cost-reimbursement type contract. The FAR (2015) states, "Cost-reimbursement contracts are suitable for use only when uncertainties involved in contract performance do not permit costs to be estimated with sufficient accuracy to use any type of fixed-price contract" (16.301-2).

Due to the uncertainties with the individual condition of each ship entering a depot-level maintenance availability, the MSMO cost-reimbursement contract (with incentives) became the vehicle of choice in an effort to gain greater efficiency, reduce waste, improve contractor motivation, and reduce cost. To better manage the risk inherent in cost-reimbursement contracts, a

> cost-reimbursement contract may only be used only when (1) the contractor's accounting system is adequate for determining costs applicable to the contract, and (2) appropriate government surveillance during performance will provide reasonable assurance that efficient methods and effective cost controls are being used. (FAR, 16.301-3[a])

The MSMO strategy used a cost-reimbursement contract due primarily to the uncertainty in requirements and was based on the premise that it would motivate the contractor to perform more efficiently. However, cost-reimbursement contracts were more complex than previous FFP maintenance contracts and therefore required

additional oversight capacity that the Navy did not possess. This lack of surveillance made it difficult to effectively manage the MSMO contracts.

3. Incentive Structure

According to the FAR, award fee and incentive fee contracts should be used to achieve specific cost, performance, and delivery objectives. Award fee contracts typically focus on "contractor performance in a wide variety of areas, such as quality, timeliness, technical ingenuity, and cost-effective management" (GAO, 2005, p. 6). Incentive fee contracts can be used to motivate contractors to achieve specific delivery targets or performance goals, but are typically used to focus on cost control (GAO, 2005, p. 6).

FAR 16.304 defines a CPIF contract as "a cost-reimbursement contract that provides for an initially negotiated fee to be adjusted later by a formula based on the relationship of total allowable target costs to total target costs" (2015).

Additionally, FAR 16.305 states that a CPAF contract

> is also a cost-reimbursement contract that provides for a fee consisting of (a) a base amount (which may be zero) fixed at the inception of the contract and (b) an award amount, based upon a judgmental evaluation by the Government, sufficient to provide motivation for excellence in contract performance.

The determination of the "fee" amount that is paid out is quite different when comparing a CPIF to a CPAF contract. The incentive fee under a CPIF structure is based on objective criteria that are included in the contract, while the award fee under a CPAF structure is based on a subjective evaluation of the contractor's performance.

Incentive contracts are used by government agencies, including the DON, as a tool to encourage contractors to complete their work in a more efficient manner. Incentives come in two forms: award fee and incentive fee. These are the only contract types that allow an agency to adjust how much a contractor is paid based on performance. "This contract type specifies a target cost, a target fee, minimum and maximum fees, and a fee adjustment formula" (FAR, 16.405-1[a]).

There are certain conditions in which incentive contracts are appropriate. The FAR states that

> incentive contracts are appropriate when a firm-fixed price contract is not appropriate and the required supplies or services can be acquired at lower costs and, in certain instances, with improved delivery or technical performance, by relating the amount of profit or fee payable under the contract to the contractor's performance. (16.401)

Consistent with the FAR, incentive contracts are designed to

1. establish reasonable and attainable targets that are clearly communicated to the contractor
2. include appropriate incentives designed to
   a. motivate the contractor's efforts that might not otherwise be emphasized
   b. discourage the contractor from inefficiency and waste (FAR, 16.401)

According to the GAO (2005), "federal acquisition regulations state that award fee and incentive fee contracts should be used to achieve specific acquisition objectives" (p. 7), such as meeting cost goals, delivering specific capabilities, or meeting schedules (p. 7). The assumption associated with adding an incentive to a contract is that improving the odds of meeting acquisition objectives requires the use of a contract "that effectively motivates a contractor toward exceptional performance" (GAO, 2005, p. 7). Choosing the right incentive structure is critical to that motivation, as are the government's ability and resources to properly oversee and rate the contractor's performance.

Incentives can be included in both fixed-price and cost-reimbursement contracts. It is usually to the government's advantage to have the contractor assume a large amount of cost responsibility and an appropriate share of the cost risk,; therefore, a fixed-price incentive contract is the preferred contract vehicle in situations where contractor costs and performance requirements are deemed to be reasonably certain (FAR, 16.401[c]). Cost-reimbursement contracts, with or without incentives, move more of the cost risk to the government and lessen the amount of cost risk to the contractor.

Depot-level maintenance periods are critical to ensuring continued material readiness of the Navy's fleet. This makes it vitally important that incentives in depot-level maintenance contracts are used appropriately while applying strong management practices to accomplish mission needs, maximize value, and minimize waste (Denett, 2007, p. 1). This also makes depot level maintenance contracts candidates for the use of award fee or incentive fee elements.

The MSMO contract utilized a mix of award and incentive fees under a cost-reimbursement contract type. Understanding the purpose and appropriate use of a cost-reimbursement contract and the issues faced by the DOD is key to understanding the Navy's use of the MSMO strategy and the subsequent shift to the MAC-MO program.

a. Award Fees

An award fee, when applied properly, is used to motivate a contractor's performance in areas that are critical to a successful maintenance availability. When using award fees, the government should utilize objective measures to support a subjective evaluation of the maintenance contractor's performance. The contractor can then be awarded a fee based on the government's evaluation of the contractor's performance in the identified critical areas. Award fee contracts are intended to be flexible, allowing contracting and program officials to change award fee criteria from one evaluation period to the next to both meet the evolving needs of the government and ensure the contractor is continually incentivized (GAO, 2005, p. 7).

Contracts with such incentives require the government to periodically evaluate the contractor's performance during the work period and compare that performance to previously established objective criteria. The award fee and incentive fee evaluation process outlined in Appendix C allows the government to assess and evaluate the contractor's performance, as well as recognize and reward progress and accomplishments. In performing the evaluation, the government can take into consideration the contractor's performance levels as well as the conditions under which the performance levels were achieved. The government's evaluations of the contractor may occur solely at the end of the contract, or the contractor may be periodically assessed at specified program milestones.

When an agency is developing the award fee strategy and selecting an award fee incentive, it must consider three interrelated factors: (a) the "dollar value, complexity and criticality" of the maintenance period, (b) "the availability of [government] resources" for monitoring and evaluating contractor performance, and (c) "the benefits expected" as a result of government oversight (DON, 2004, p. 1). The requirement for the government to monitor and evaluate the contractor means award fee contracts inherently require additional administrative and management effort. As a result of this increased burden on the government, award fee contracts "should only be used when the contract amount, performance period, and expected benefits warrant the additional administrative and management effort" (DON, 2004, p. 1).

FAR 16.405-2 states that a CPAF contract (a) provides for a fee that consists of a base amount that can be fixed at the inception of the contract, if applicable, at the contracting officer's discretion, and (b) allows the contractor to earn an award amount during the performance period. The award amount is meant to provide motivation for excellence in cost, schedule, and/or technical performance. The customer rates the contractor's performance, and as a result the rating is more subjective in nature.

An award fee incentive is most suitable when key performance objectives cannot be objectively or quantitatively measured, or may change during the course of contract performance. There are also a number of factors that determine when an award fee contract is the appropriate type of contractual arrangement. The *Navy/Marine Corps Award-Fee Guide* lists the following factors:

- Contractor motivation—An award fee incentive coupled with identification of specific areas that are key to a program's success provides motivation for the contractor to concentrate resources in the areas that are critical to the success of the maintenance availability.
- Administrative cost versus expected benefits—The award fee evaluation process requires additional documentation and briefings when compared to the monitoring necessary for alternative contract types, leading to higher labor requirements and increased administrative costs throughout all award fee periods. To determine if an award fee contract should be utilized, an analysis should be conducted in accordance with FAR 16.405-2(c) to demonstrate that the benefits warrant the increased administrative burden.
- Contract value—Total contract value may not be the most important consideration, and therefore dollar thresholds are to be avoided as a sole determinant in selecting use of an award fee contract.
- Hybrid contracts—A hybrid or combined contract type of award fee and incentive fee may be used depending upon the suitability of various portions of the contract to differing measurements (e.g., objective/quantitative versus subjective/qualitative).
- Contractor Performance Appraisal Report System (CPARS)—CPARS should be used to ensure that the evaluation process is consistent throughout the period of performance, but it shall not be used as part of the award fee criteria.
- Earned Value Management (EVM)—If EVM is consistent with factors being utilized to improve contractor performance, then EVM metrics may be used as award fee criteria. There should be consistency between the award fee, CPARS, and EVM metrics (DON, 2004, pp. 4–6).

b. Incentive Fees

As previously mentioned, the CPIF contract provides for a fee to be pre-negotiated. This initial fee is later adjusted by a formula, and the adjustment is based on whether the contractor has over-run or under-run the contract (cost basis). This formula adjusts the fee based on any difference between the target cost and the total allowable cost as originally agreed upon under the terms of the CPIF contract. Unlike a fixed-price incentive contract, a CPIF contract establishes a minimum and maximum limit to the amount the fee can be adjusted. Since the fee adjustment is made based on terms agreed upon in the CPIF contract, the contractor is incentivized to control costs in order to earn a higher fee. This is an objective way to measure performance.

c. GAO Feedback on DOD Use of Incentives

Award fee and incentive fee contracts have been used across all agencies and at all levels in the DOD to motivate excellent contractor performance, especially in areas deemed critical to a program's success (GAO, 2005). The 2005 GAO Report 06–66, *DOD Has Paid Billions in Award and Incentive Fees Regardless of Acquisition Outcome,* found that the DOD has little evidence to support its claim that award fee and incentive fee contracts are improving contractor performance. The GAO report also stated that the DOD's management and evaluation practices undermined the "effectiveness of fees as motivational tools," marginalized the use of award fees and incentive fees in holding contractors accountable for outcomes, and wasted taxpayer funds (GAO, 2005, "Highlights," para. 2). Furthermore, programs routinely paid a significant portion of the fee for performance levels in categories such as "acceptable" and "satisfactory" despite federal regulation and military service guidance stating that the purpose of the award fee or incentive fee is to motivate "excellent" performance (i.e., performance that goes above and beyond minimal acceptability; GAO, 2005, p. 3). Poor use of contract incentives reduced the effectiveness of award fees and incentive fees as motivational tools for performance and compromised the integrity of the process.

The DOD's failure to properly administer award and incentive fee contracts limited the effectiveness of this type of contractual agreement (GAO, 2005, p. 4). The GAO determined that the DOD had no performance measures with which to evaluate or compile data on the effectiveness of award and incentive fees. Another issue discovered in the 2005 study by the GAO was that the DOD often placed emphasis on such things as the "responsiveness of contractor management" to DOD feedback and the "quality of contractor proposals, or timeliness of contract data requirements" (GAO, 2005, p. 4) instead of defining contractor performance in terms of acquisition cost, schedule, or performance (GAO, 2005, p. 4). The report also showed that the DOD had not conducted any evaluations on its own to

determine the effectiveness of award and incentive fee contracts. This resulted in the GAO assertion that the DOD has paid billions in incentive fees and award fees without favorably influencing performance outcomes (GAO, 2005, p. 4). As guidance to improve the performance of incentive and award fee programs, the GAO provided the DOD with several recommendations: (a) improve its use of fees by tying them to specific desired outcomes in award fee and incentive fee contracts, maximizing the contractor's motivation to perform, and (b) collect data that would allow an evaluation of the effectiveness of fees (GAO, 2005, pp. 33–34).

The findings of the 2005 GAO study and the recommendations therein prompted the Office of Management and Budget (OMB) to issue guidance in December 2007 that directed agencies to take action to improve the use of incentive contracts. The guidance directed agencies to "review and update their acquisition policies" and focused on four fundamental practices: (a) linking award fees to acquisition outcomes, (b) prohibiting payment for contractor performance judged to be less than satisfactory or not meeting contract requirements, (c) limiting the use of rollover,[1] and (d) emphasizing excellent performance as opposed to effort (OFPP, 2007, p. 1).

Additionally, the National Defense Authorization Act for FY 2007 (Pub. L. No. 109–634) implemented award and incentive fee data collection requirements to force the DOD to develop a system to properly evaluate the effectiveness of award and incentive fees. An Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]) memorandum to the military departments stated that it was the policy of the USD(AT&L) that objective criteria would be used, whenever possible, to measure contract performance (Assad, 2007, p. 1). The key elements of this memorandum can be found in Appendix A.

After implementation of this guidance, the GAO was asked to (a) identify agency actions to revise or develop award fee policy or guidance, (b) assess the consistency of contracting practices with the new guidance, and (c) determine the extent of collection, analysis, and sharing of award fee information being conducted by government agencies (GAO, 2009, p. 2). After reviewing 50 contracts, the GAO (2009) determined that "current agency practices for using award fee contracts often are not consistent with the new OMB guidance" (p. 3). The GAO study (2009) also found that where revised guidance was applied, the DOD would achieve an estimated $450 million of savings by "limiting the use of rollover and through tying award fee criteria to acquisition outcomes" (p. 3).

[1] Rollover is the process by which available, unearned award fee is moved from one evaluation period to a subsequent evaluation period. This allows a contractor additional opportunity to earn the previously unearned portion of the award fee (DON, 2004, p. 2).

The GAO study also found that practices that were in alignment with the new guidance were not being implemented consistently at all levels or across all programs. They found that although the DOD was following OMB and internal guidance on the collection of data on the use of award fees, it was being used primarily to "respond to legislative requirements for information" (GAO, 2009, p. 28) and not as a tool for evaluating the "effectiveness of award fees as a tool for improving contractor performance" or "achieving desired program outcomes" (GAO, 2009, p. 4).

4. Outcomes in Ship Maintenance

The MSMO incentive structure varied depending upon whether the particular MSMO contract was CPAF or a combination of CPAF and CPIF. The CPAF MSMO contract contained a 10% maximum award fee (2% each for technical and schedule performance, and 3% each for management and cost performance), and a small business utilization fee of 1.232%, for a total possible fee of 11.232%. The CPIF MSMO contract still had a total possible fee of 11.232%, but it was made up of a 4% award fee (1.6% for technical and 2.4% for management performance) and a 7.232% incentive fee (6% for cost and 1.232% for schedule performance; NAVSEA, 2013, p. 5).

The MSMO contract strategy led to improvements in Navy and industry relationships, and contractors began taking ownership of planning and execution. However, despite incentives to the contrary, there were still significant issues related to costs associated with growth and new work, poorly defined requirements, and trouble meeting scheduled milestones (NAVSEA, 2013, p. 5). These were issues the Navy was determined to correct with its next contract strategy, MAC-MO.

D. MULTIPLE AWARD CONTRACT–MULTIPLE ORDER CONTRACTS

1. Contract Strategy

On November 10, 2014, the CNO published OPNAV Instruction 3000.15A, which explained and established policy for his newly created optimized fleet response plan (OFRP). According to Commander, United States Fleet Forces Command (USFF), Admiral Bill Gortney, the OFRP had several intentions, including streamlining the fleet inspection and training cycle and instilling stability throughout a 36-month cycle that consisted of six months of maintenance, six months of training, and 24 months of operational availability. Another intention of the OFRP was to sustain capabilities through effective and timely maintenance and modifications (Gortney, 2014, slide 4). The key to maintaining the OFRP's tight schedule started with the ship maintenance period, which indicated the beginning of the OFRP.

In 2013, although NAVSEA determined that collaboration and ownership had improved using the MSMO approach, the Navy lacked the necessary resources required to effectively manage the contract (i.e., the manpower required to consistently monitor the contractor and accurately rate his performance was not available). In response, CNRMC and NAVSEA 21 set out to create an even more efficient and effective contracting strategy, MAC-MO. MAC-MO uses FFP competitions with multiple contract awards and is intended to keep Navy ship maintenance on track with the OFRP.

a. Multiple Award Contracts

MSMO contracts were awarded to a single contractor with multiple options for future ship repair. One of the greatest differences with MAC-MO is that the contract is awarded to multiple contractors who then compete for task orders.

Multiple award contracts (MACs) were first introduced into legislation by the Federal Streamlining Act of 1994 (FASA), and later implemented in FAR Subpart 16.5. FASA stated that contracting officers could "award separate task order contracts … for the same or similar services to two or more sources" (FASA, 1984, § 2304b). A 1999 study by the Office of Federal Procurement Policy (OFPP) described the benefits of using MACs. Specifically, it stated that MACs allowed the government to continuously use competition resulting in "lower prices, better quality, reduced time from requirements identification to award, and improved contractor performance in satisfying customer requirements" (OFPP, 1999, Ch. 2).

b. Third-Party Planning

The MAC-MO contracting strategy uses third-party planning. Under MSMO contracts, contracts were planned by the Navy and prime contractors. Now, similar to a Lead System Integrator (LSI), a third party will be awarded a CPAF/IF contract for planning a specific availability. The draft statement of work (SOW) states that the third-party planner will be responsible for the following:

- availability assessment and planning
- execution support
- integrated logistics support
- maintenance database and feedback analysis
- special projects
- long lead-time material procurement and inventory management (NAVSEA, 2014, p. 1)

This is not the first time the Navy has contracted planning services for ship maintenance and modernization. The Navy awarded previous contracts for maintenance planning, naming certain contractors the planning yard for a particular ship or class. For example, the Navy currently has advanced planning contracts with Bath Iron Works for DDG51, FFG7, and more recently, the LCS program (Wickenheiser, 2014, para. 2).

In addition to multiple award contracts and third party planning, the MAC-MO incentive structure is different from the FFP and MSMO contract strategies. The Navy once again changed its incentive strategy for surface ship maintenance in an effort to properly motivate MAC-MO contractors while taking into account the limited governmental resources available to manage the contracts.

2. Incentive Structure

The MAC-MO maintenance contract is FFP, and therefore contains no incentive to exceed the requirements detailed in the contract, but the third-party planning contract associated with MAC-MO contains both award terms and incentive fees.

The FY 2015 to FY 2019 third-party planning contract proposal for DDG51- and CG47-class ships has an award term consisting of a one-year base period, two one-year options, and two one-year award term options. Award term options allow the contractor to earn the right to continue performance. In other words, if the government deems the contractor performed well during evaluation periods, the option exists to add time (i.e., an award term) to the contract rather than simply give the contractor an extra fee for good performance. The award term options comprise evaluation periods starting at contract award to 18 months and from 18 months to one year thereafter. The evaluation criteria are made up of quality of work and timeliness, cost performance, and subcontractor performance (NAVSEA, 2014, pp. 5–8).

The third-party planning contract also has performance incentive fees, and according to NAVSEA's proposed contract, they are "designed to provide economic motivation for the contractor to produce high quality products and services on a timely basis that support [the] Navy's maintenance and modernization planning objectives (NAVSEA, 2014, p. 2). The incentive fee amounts are made up of the accuracy of the work specification (80%) and Master Specification Catalog (MSC) template improvement (20%). The work specification quality is based off of *JFMM* requirements. The MSC incentive is to provide incentives for the contractor to submit feedback to the government in order to improve current routine maintenance work specifications, which will reduce costly contract changes in future maintenance availabilities.

MAC-MO program officials also expect to award a CPAF contract for emergent maintenance, although no contracts have been awarded for this task to date. Emergent maintenance is conducted when a ship unexpectedly suffers an equipment or structural failure that requires immediate attention. In the past, these types of casualties were covered under the main maintenance contract, but the MAC-MO strategy issues a separate contract to cover this type of work. This is a more appropriate structure because the FFP contract is rigid in nature and demands definitive requirements that cannot be determined ahead of time in emergent maintenance. The CPAF contract not only provides the flexibility in requirement determination, but also incentivizes the contractor to quickly correct the emergent maintenance need.

3. Expected Outcomes

NAVSEA expects the MAC-MO strategy to improve ship maintenance availabilities in the following ways:

- improved work package through better defined requirements
- increased price competition
- separation of the planning function from the execution function to encourage consummate behavior (NAVSEA, 2013, p. 7)

The MAC-MO strategy is intended to make the improvements listed above in order to lower costs, shorten schedules, and improve the overall quality of Navy ship maintenance availabilities.

E. SUMMARY

This chapter defined previous CNO availability contracting methods and maintenance outcomes. It also described the use of awards and incentives to improve efficiency and effectiveness, along with a description of the new MAC-MO contract strategy and expectations for future maintenance availability outcomes.

III. DATA AND METHODOLOGY

A. DATA COLLECTION

The data for this project was collected, processed, and provided by NAVSEA, CNRMC Code 400. The data provided by CNRMC was collected from two primary sources: (a) the Surface Engineering Maintenance Planning Program (SURFMEPP), and (b) the Navy Maintenance Database (NMD).

The Navy established the SURFMEPP in November 2010 to provide a centralized planning tool for surface ship life-cycle management, including ship class maintenance and modernization. SURFMEPP provides supporting tools that capture and analyze maintenance history and execution and return cost data for each availability, and serves as a library of technical-based requirements for each class of ship (NAVSEA, n.d.). The class-specific historical data is analyzed and used to improve the budget and scheduling aspects of CNO-scheduled maintenance availabilities and is separate from the NMD. The SURFMEPP data for this project is provided to CNRMC in a spreadsheet format that is titled "SURFMEPP Availability Completion Tracker W-X-Y-Z (WXYZ) data." CNRMC receives updated WXYZ spreadsheets from SURFMEPP the first week of every month. Examples of data fields in the SURFMEPP database that are exported into the WXYZ file are class, ship name, start date, and end date of the availability. The WXYZ also contains the number of man days and the total dollar requirement of each availability.

The NMD is used by government maintenance teams and contracting officers at maintenance activities to plan and execute ship maintenance and repair projects. Its primary purpose is to provide for the integration and automation of Supervisor of Shipbuilding (SUPSHIP) planning and execution functions. More specifically, the NMD captures cost of growth data and tracks it at the configuration change level. It is also used to improve the quality of future work specifications by capturing lessons learned and providing growth analysis metrics. Examples of data fields contained in the NMD include class, hull, avail start date, avail end date, avail type, contract type (e.g., MSMO), and status (e.g., active, completed).

B. DEFINING AN OPTIMAL PROCUREMENT MAINTENANCE STRATEGY

The current metrics used by CNRMC to measure the efficiency and effectiveness of the MSMO and MAC-MO contracting strategies are (a) cost growth resulting from new work and growth work, (b) percentage of on time award, (c) percentage of on time completion, and (d) number of lost operational days. The data source and definition of each metric is as follows:

1. Cost Growth

Cost growth is the percentage of growth work and new work, measured in dollar value, in comparison to the total original contract value. It is calculated by dividing the total dollar value of Requests for Contractual Change (RCC) by the total dollar value of the contract. This information was retrieved from data in the NMD.

2. On Time Award

On time award (OTA) tracks the number of days that the contract was awarded past the estimated contract award date. It is calculated by subtracting the actual award date from the estimated or ideal award date. The data used to determine the performance metric was retrieved from the WXYZ file.

3. On Time Completion

On time completion measures the percentage of availabilities that were completed on time. This metric is calculated by dividing the number of availabilities completed on time by the total number of completed availabilities in a given period (e.g., FY 2014). The data for this analysis was retrieved from SURFMEPP and includes information from all seven of the Navy's Regional Maintenance Centers.

4. Lost Operational Days

Lost operational days (LOD) measures the number of operational days lost as a result of a ship's maintenance availability exceeding the original planned availability duration. Trends in this data help predict availability durations and execute them as planned. It is calculated by subtracting the planned availability duration from the actual availability duration using data from CNO availabilities that are closed, as well as CNO availabilities that are active. The data was retrieved from both the WXYZ data and NMD.

C. ANALYSIS METHOD

The method of analysis for the project is a comparison of the pertinent metrics from MSMO contracts to metrics calculated using the available metrics from the initial MAC-MO contracts.[2] A comparison of the MSMO metrics to MAC-MO metrics determines whether the MAC-MO program shows an improvement in efficiency or effectiveness.

[2] A comparison to the FFP strategy was not made due to the lack of available data.

D. SUMMARY

This chapter outlines the source of the project data and the methodology that is used in the analysis of the data. In addition, it defines the key performance measures being used by CNRMC to evaluate the efficiency and effectiveness of CNO maintenance availabilities and their underlying contract vehicle.

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IV. FINDINGS, RESULTS, AND RECOMMENDATIONS

A. DATA ANALYSIS

In this section, the metrics, which are (1) cost growth resulting from new work and growth work, (2) percentage of on time award, (3) percentage of on time completion, and (4) number of lost operational days, are presented graphically. The graphs are used to evaluate the efficiency and effectiveness of the MAC-MO contract as it relates to CNO maintenance availabilities.

1. Cost

The total cost of a maintenance availability is linked directly to technical performance and schedule, and as a result is a direct reflection of contractor performance and program management. CNRMC identified the percentage of growth and new work as a key metric in the evaluation of the performance of the third-party planner, the contractor, and program management during CNO availabilities. It is also a valuable measure of the effectiveness of the contracting methodology used to identify contract requirements and support elements during the planning process, as well as the controls established to allow availability managers to effectively control growth and ultimately reduce cost overruns.

As seen in Figure 1, from FY 2013 through FY 2015, the percentage of growth and new work of ship maintenance under the MSMO structure averaged 48.33%, with a high of 52% in FY 2013 and a low of 44% in FY 2014. By comparison, the data on ship maintenance availabilities under a MAC-MO FFP contract indicate a cost growth of 21%. Initial indications are that the MAC-MO contract vehicle could result in a 52–60% reduction in cost growth when compared to the MSMO contract.

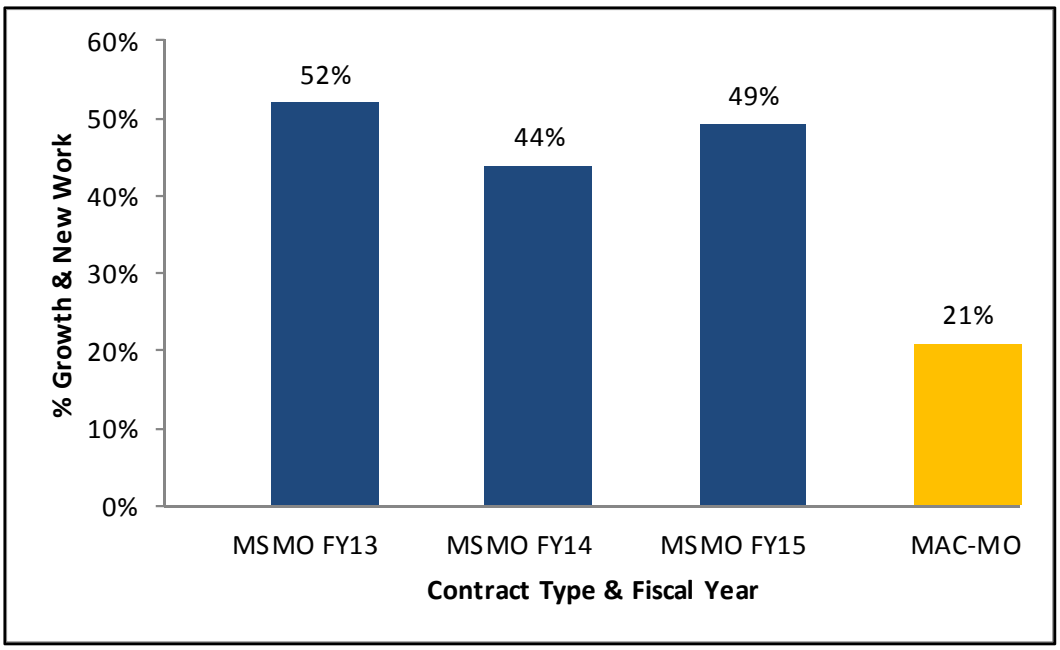

Figure 1. Percentage of Growth and New Work

2. On Time Award

When a contract award is late, it can result in the delay in the commencement of a maintenance availability. This can lead to delays in the completion of the overall maintenance period as well as to increased costs as contractors push to remain on schedule. For this reason, the OTA Days Late metric is used to evaluate the effectiveness of maintenance availability and contract managers.

The graph in Figure 2 shows that the average OTA Days Late for MSMO was as low as 11 days in FY 2013 and as high as 21 days in FY 2014, with a three-year average of 15 days. The MAC-MO program, based on limited data, has an average OTA Days Late measure of 13 days, which is the same level reported under the MSMO program in FY 2015. Based on this information, it is not possible to draw a definitive conclusion as to the effect that the MAC-MO strategy has on improving the OTA of contracts when compared to the MSMO strategy.

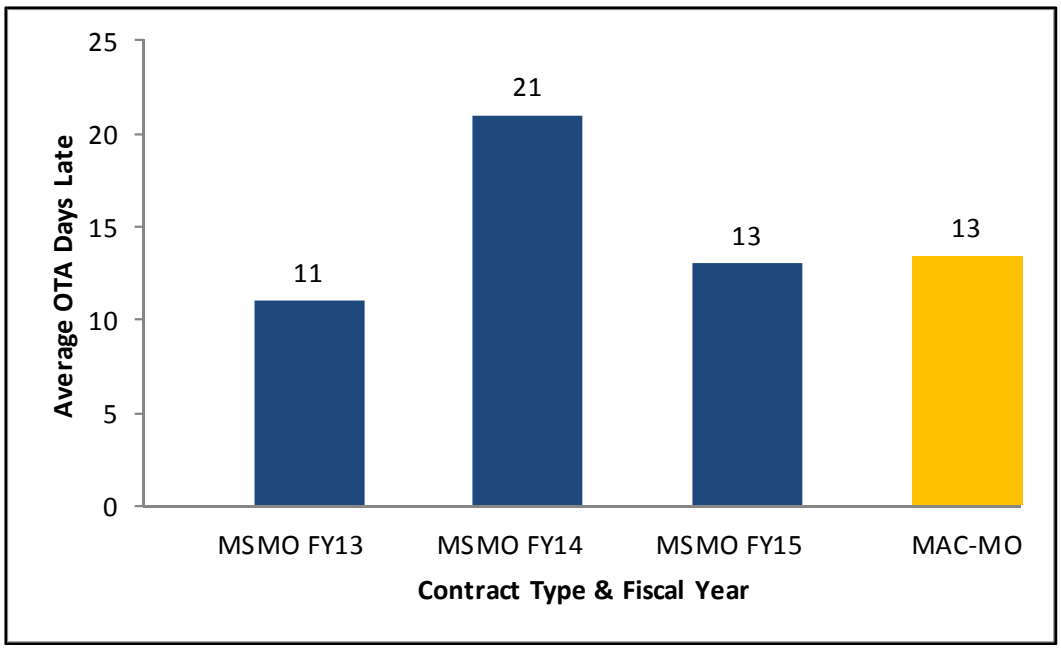

Figure 2. Average On Time Award (OTA) Days Late

3. On Time Completion

As already expressed, the OFRP emphasizes the importance of schedule. To evaluate the performance of the MAC-MO strategy in terms of schedule, the OTC of availabilities was compared to that of availabilities contracted using the MSMO strategy. As shown in Figure 3, the availabilities contracted using the MAC-MO strategy had a 33% OTC rate. In comparison, the MSMO strategy has a three-year average OTC rate of 24.3%, ranging from a low of 18% in FY 2014 to a high of 33% in FY 2015. However, the initial indications are that the MAC-MO OTC rate, based on the data available, is better than the three-year average under MSMO. The data shows that MAC-MO may have resulted in as much as a 45% improvement over FY 2014 MSMO performance; however, there is no improvement when compared to FY 2015 MSMO data. Additionally, this data metric can be influenced by unforeseen events that affect a ship's maintenance availability that are beyond the scope of the contract, contractor, and government to anticipate or control.

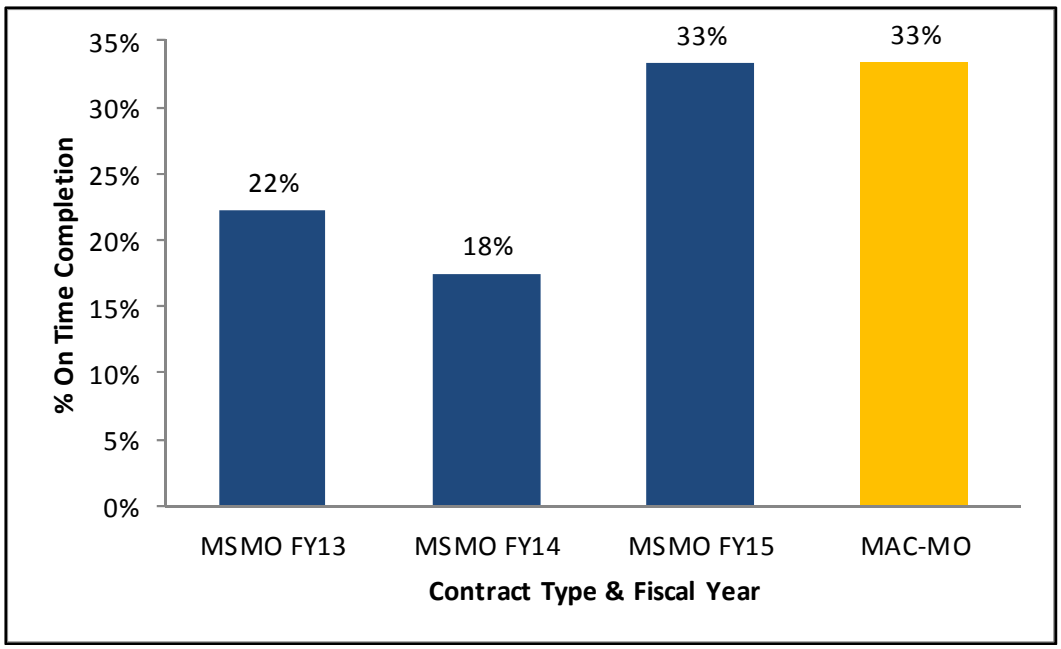

Figure 3. Percentage of On Time Completion (OTC)

4. Lost Operational Days

Trends in LOD help predict availability duration and availability execution. The lower the number of LOD, the better the fleet can support the OFRP. For these reasons, LOD is a useful metric when evaluating the performance of MSMO and MAC-MO contract strategies in terms of schedule. The data analysis, as seen in Figure 4, shows that the MSMO contracts have a three-year LOD average of 30.7 days, and that the LOD has a downward trend from a high of 44 in FY 2013 to a low of 13 for FY 2015. In comparison, the initial MAC-MO availabilities have an average LOD of 30, which is 130% greater than the FY 2015 figure for MSMO availabilities. This could be a result of unforeseen growth or new work requirements, as well as a potential learning curve because of the contract strategy, third-party planner, or contractor performance.

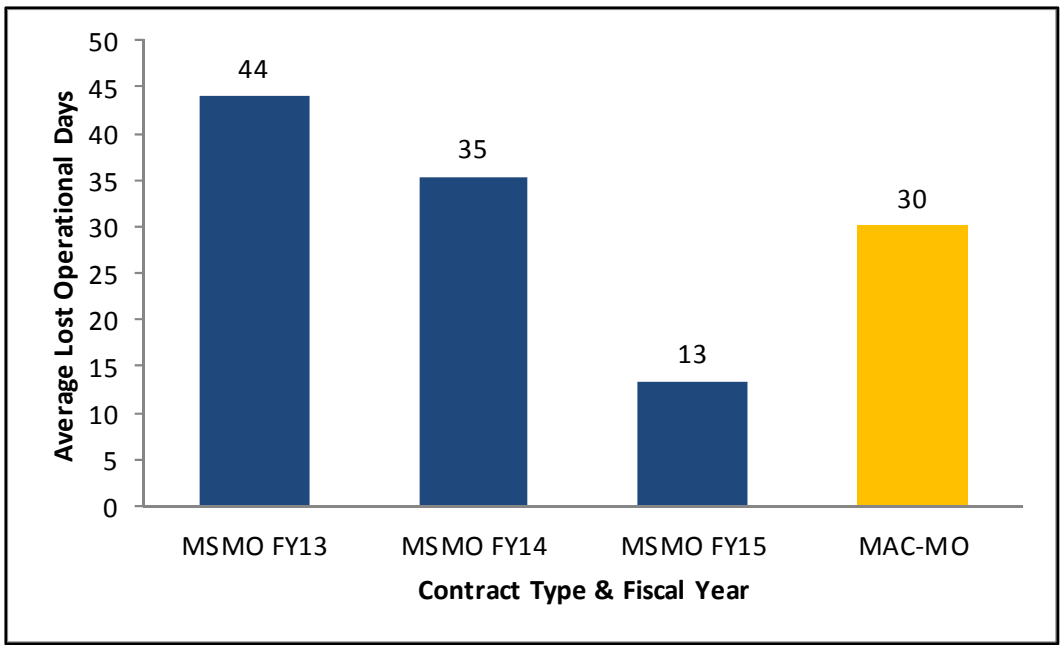

Figure 4. Average Lost Operational Days (LOD)

B. DISCUSSION

The data analysis above examines the performance of the MAC-MO strategy and the impact the strategy has on cost, schedule, and quality performance at all levels of the maintenance availability.[3] To arrive at a conclusion, the data was compared to help determine whether the change in ship maintenance contract strategy resulted in improvements in efficiency and effectiveness and met the overall objectives of the MAC-MO program. Based on the data analysis initial indications are that the MAC-MO program is more effective at controlling costs based on the percentage of growth and new work comparison, but improvements based on the OTA, OTC, and LOD metrics are inconclusive or do not exist in the current data.

One of the key objectives of the MAC-MO strategy was to drive down costs. As stated in Chapter 2, this strategy would aid in improvements in cost control through the continuous use of competition and the use of a third-party planner. Contractors continuously compete to be awarded work under a MAC, while third-party planners operate under a CPAF where award fee is based on evaluation criteria consisting of quality of work and timeliness, cost performance, and subcontractor performance. Based on the data analysis for this project, the MAC-MO strategy, through its continuous use of competition and third-party planner incentives, is more effective at controlling growth and new work than the MSMO strategy.

[3] Data from the USS *Porter* maintenance availability, completed under an FFP contract, was removed from the data analysis due to factors not normally associated with CNO maintenance availabilities. Charts including data from the USS Porter are included in Appendix B.

As mentioned in Chapter 2, one of the goals of the OFRP was to efficiently schedule all required maintenance, training, and evaluations in a manner that would drive down costs and increase overall fleet readiness. A driving factor in meeting fleet readiness goals is the timely and cost efficient execution of maintenance and modernization periods. One of the metrics that is used to measure the time aspect of maintenance and modernization availabilities is the OTA calculation. When a contract is not awarded or definitized on time, not only are there schedule implications, but also contract risk implications. Under an undefinitized contract, the risk to the contract increases (e.g., requirement changes, cost overruns, schedule delays) when the contractor is authorized to commence work before a final contractual agreement is reached. The data in Figure 2 indicates that the OTA Days Late measure for the MAC-MO program is similar to that of the MSMO program, indicating that in the early stages of this strategy there are no improvements in this area.

The metrics OTC and LOD not only address the issue of schedule performance, but are also indications of how well the third-party planner executed availability assessment and planning that led to availability milestones and deadlines being met. The results in Figures 3 and 4 do not offer evidence that the MAC-MO strategy of using a third-party planner has resulted in improvements in OTC or a reduction in LOD. As a result, there are no visible indications of meeting the objective of improvements in schedule performance when compared to the MSMO strategy. However, there may be a learning curve associated with the early stages of the MAC-MO strategy, and as such, further study would be warranted after additional availabilities have been completed.

C. LESSONS LEARNED AND RECOMMENDATIONS

In FY 2014 and FY 2015, NAVSEA executed two Delivery Orders for MAC-MO contracts in San Diego, CA. Although both ships were viewed as non-major CNO availabilities, NAVSEA Southwest Regional Maintenance Center (SWRMC) collected multiple lessons learned for future MAC-MO contracted maintenance availabilities. SWRMC identified the following lessons learned and recommendations:

- There is a learning curve for the third party planner and regional maintenance center's reviewing specifications—multiple requests for specification clarification were received by the Navy from the third party planners and regional maintenance centers.
- Long lead time material for more complex availabilities needs to be managed differently—not all material can be ordered and scheduled

for delivery at the award date, and it is challenging to do so before the contract award.

- NMD access for the third party planner is challenging, and the third party planner's execution of the NMD has a steep learning curve.
- Ship checks are more important for the MAC-MO contract holders than when using MSMO contracts due to the loss of long-term access to a ship/entire class.
- NAVSEA standard items for schedule and associated reports inclusion in the request for proposal (RFP) is valuable in determining lowest price technically acceptable (LPTA).
- Leaving enough time between RFP release and submitting offers requires 45 days to be effective.
- The current award schedule does not allow the winning contractor to be adequately prepared for the Work Package Execution Review (WPER). It is recommended that CNO MAC-MOs are awarded at A-60.
- All new work should be planned by the third party planner. All growth work should be planned by the local regional maintenance center (NAVSEA, 2015, slides 4–5).

The majority of SWRMC's concerns were related to the third party planning aspect of MAC-MO. Learning curves and access to information will need to be addressed in order for the MAC-MO to be as efficient and effective as initially planned. In addition to its third party planning apprehensions, SWRMC also stated that the inclusion of the new MAC-MO strategy could considerably impact availability management "without significant investment in training and … hiring to approved staffing levels" (NAVSEA, 2015, slide 2).

D. SUMMARY

This chapter analyzed the following metrics: (1) cost growth resulting from new work and growth work, (2) percentage of OTA, (3) percentage of OTC, and (4) number of LOD used to evaluate the efficiency and effectiveness of the MAC-MO contract. Lessons learned and recommendations from the MAC-MO pilot program were also presented and could be valuable for future MAC-MO contract actions.

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V. SUMMARY, CONCLUSIONS, AND AREAS FOR FURTHER RESEARCH

A. INTRODUCTION

The objective of this research was to present results from appropriate and relevant data, specifically information from ongoing and completed MAC-MO contracts. Using this data, a comparison was made to previous MSMO contracts, and analysis was conducted in order to address the following research questions:

- Are MAC-MO contracts the most efficient and effective contracting method for CNO availabilities?
- Are MAC-MO contracts meeting their objectives?
- Are there any best practices from successful MAC-MO contracts?

The remainder of this paper answers these research questions, provides limitations of the study, and suggests areas for future research.

B. ANSWERS TO RESEARCH QUESTIONS

1. Research Question 1: Are MAC-MO Contracts the Most Efficient and Effective Contracting Method for CNO Availabilities?

The answer to this research question is “yes” and “no.” The MAC-MO contracts are out-performing MSMO in terms of percentage of growth and new work, but initial indications are that improvements based on the OTA, OTC, and LOD metrics are inconclusive or do not exist in the current data. When MAC-MO is compared to the average of the last three fiscal years of MSMO contracts, the results are similar. Although there is a 9% increase in OTC, that amount is not large enough for it to be deemed successful. Figures 5 and 6 compare the MAC-MO data to the MSMO three-year averages:

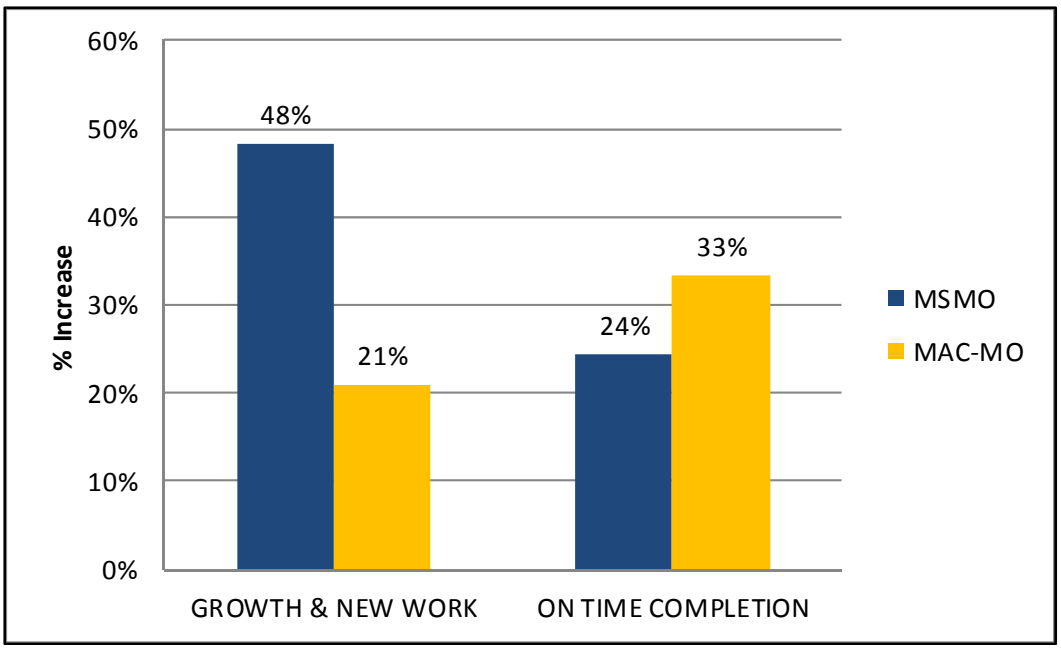

Figure 5. Percentage of Growth and New Work, and Percentage of OTC

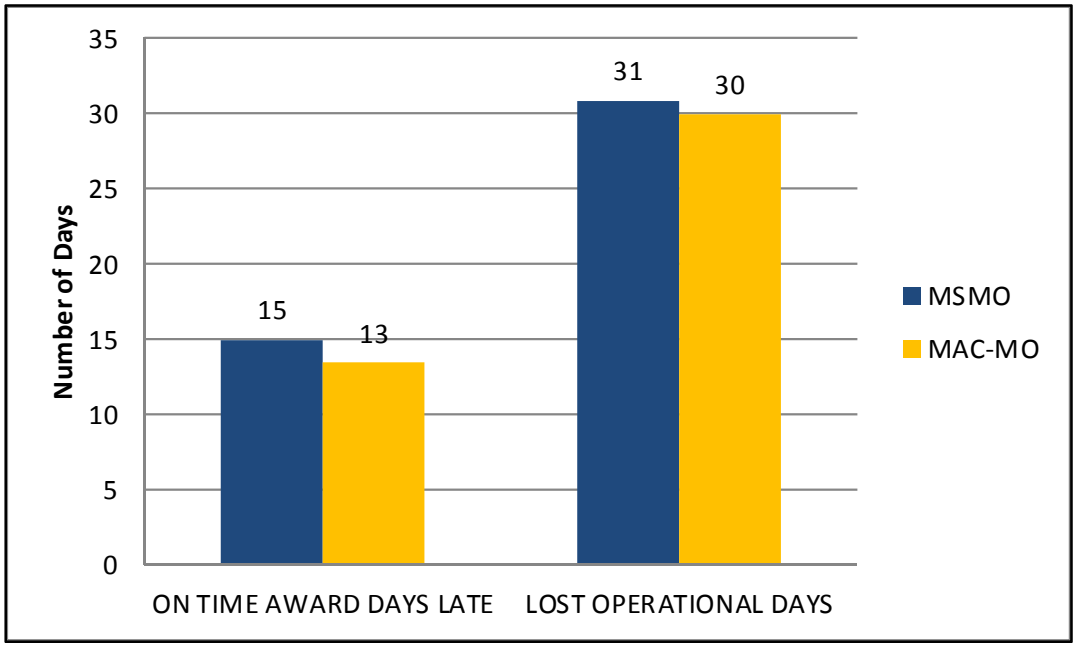

Figure 6. OTA Days Late and LOD

2. Research Question 2: Are MAC-MO Contracts Meeting Their Objectives?

The answer to this research question is also both "yes" and "no." As mentioned in Chapter 2, the primary objectives of MAC-MO are to lower costs, shorten schedules, and improve the overall quality of Navy ship maintenance

availabilities through (a) improved work package and requirements generation, (b) increased price competition, and (c) separation of the planning function from the execution function to encourage consummate behavior (NAVSEA, 2013, p. 7).

Figure 1 suggests that MAC-MO is more effective at controlling growth and new work than the MSMO strategy, and therefore is meeting the Navy's objective of controlling costs. Contractor consummate behavior and increased price competition could be loosely connected to all of CNRMC's metrics, but one can only infer if the objectives are being met. Lower rates of growth work and new work may also be attributable to the effectiveness of the third party planner at assessing and planning the availability. As stated in Research Question 1, initial indications are that improvements based on the OTA, OTC, and LOD metrics are inconclusive or do not exist in the current data, and therefore Research Question 2 cannot be fully answered.

3. Research Question 3: Are There Any Best Practices From Past Successful MAC-MO Contracts?

The answer to this research question is "yes." NAVSEA SWRMC identified several lessons learned and presented them at the January 2015 Maintenance and Modernization Performance Review (MMPR). SWRMC recognized that the learning curve associated with the third party planning aspect of MAC-MO requires attention, and it also identified a potential manning shortfall that could impact managing the MAC-MO contracts.

C. LIMITATIONS OF STUDY

The primary limitation of this study was the amount of data available for the MAC-MO program. This program is considered a pilot program, and the available data was limited to two availabilities during FY 2014 and FY 2015 that were contracted using the full MAC-MO strategy. The researchers also included five additional ships that were contracted using the FFP portion of the MAC-MO strategy during the same FY 2014 through FY 2015 timeframe. This data limitation precludes any ability to identify trends that may indicate areas of improvement, inefficiency, or effectiveness over time for the MAC-MO program that would allow the researchers to make a final determination as to the benefits of this strategy.

A second limitation of the study is the metrics used by the researchers to try to answer the research question. The metrics used are indicators of the performance or progress of a ship's maintenance availability, but they may not necessarily be the best indications of the success of a particular contract strategy. In particular, these metrics do not allow for an analysis of the award of incentives to the contractor based on their performance. Both the MSMO and MAC-MO strategies contain award fee and incentive fee elements, and an analysis of award fee plans and actual award

fee earned by the contractor in addition to any profit or fee earned from contract incentives might prove beneficial to answering the research question.

D. AREAS FOR FURTHER RESEARCH

In this report, the researchers attempted to determine (a) if the objectives of the MAC-MO contract strategy were met, and (b) if the MAC-MO strategy has led to improved effectiveness and efficiency of CNO maintenance contract procurement. As noted above, current MAC-MO data is limited and therefore allows for the following areas worthy of consideration for further research:

- Increase the number of MAC-MO contracts analyzed beyond the limited data set presented in this project.
- Perform an in-depth comparison to other commercial and military services maintenance procurement contracting methods.
- Develop metrics that are directly tied to the stated MAC-MO objectives.
- Analyze award fee and incentive fee elements of MAC-MO and MSMO contracts.
- Analyze the third party planner element of MAC-MO to include contract structure, incentive plan, and performance measurement plans.

REFERENCES

American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1554, 123 Stat. 115 (2009).

Assad, S. D. (2007, April 24). *Proper use of award-fee contracts and award-fee provisions* [Memorandum]. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (OUSD[AT&L]). Retrieved from http://www.acq.osd.mil/dpap/policy/policyvault/2007-0197-DPAP.pdf

Brown, T., & Kim, Y. (2012). The importance of contract design. *Public Administration Review*, *72*(5), 687–96.

Caprio, J., & Leszczynski, D. (2012, June). *A preliminary investigation into CNO availability schedule overruns* (Master's thesis, Naval Postgraduate School). Retrieved from http://calhoun.nps.edu/handle/10945/7315

Caulderwood, K. (2014, February 27). Five things to know about the world's largest shipping company: Maersk cautiously optimistic about global outlook. *International Business Times*. Retrieved from http://www.ibtimes.com/five-things-know-about-worlds-largest-shipping-company-maersk-cautiously-optimistic-about-global

Commander, Navy Regional Maintenance Center (CNRMC). (2012, April 9). *Adding work to availability work packages (AWP) for Chief of Naval Operations availabilities* [Memorandum]. Washington, DC: Naval Sea Systems Command (NAVSEA).

Commander, U.S. Fleet Forces Command (CFFC). (2013, November 25). *Joint fleet maintenance manual* (COMUSFLTFORCOMINST 4790.3). Retrieved from http://submepp.ahf.nmci.navy.mil/jfmm/

Denett, P. (2007, December 4). *Appropriate use of incentive contracts* [Memorandum]. Washington, DC: Office of Management and Budget (OMB). Retrieved from http://www.ago.noaa.gov/acquisition/docs/oppp_memo_incentive_contracts_2007.pdf

Department of Defense Inspector General (DODIG). (2008, April). *Obligation of funds for ship maintenance and repair at the U.S. Fleet Forces Command regional maintenance centers* (Report No. D-2008-083). Retrieved from http://www.dodig.mil/audit/reports/fy08/08-083.pdf

Department of Homeland Security (DHS). (2013, February). *Budget-in-brief: Fiscal year 2014.* Retrieved from http://www.dhs.gov/sites/default/files/publications/MGMT/FY%202014%20BIB%20-%20FINAL%20-508%20Formatted%20%284%29.pdf

Department of the Navy (DON). (2004, July). *Navy/Marine Corps award-fee guide.* Washington, DC: Office of the Assistant Secretary of the Navy for Research, Development & Acquisition. Retrieved from http://www.secnav.navy.mil/rda/Policy/2004%20Policy%20Memoranda/awardfeeguideword.doc

Department of the Navy (DON). (2015, February). *Department of the Navy fiscal year (FY) 2016 budget estimates.* Retrieved from http://www.finance.hq.navy.mil/FMB/16pres/OMN_Vol1_BOOK.pdf

Federal Acquisition Regulation (FAR), 48 C.F.R., 16.202–16.405 (2015).

Federal Acquisition Streamlining Act of 1994 (FASA), Pub. L. No. 103-355, § 2304, 108 Stat. 3243 (1994).

Gortney, B. (2014, January 15). *Optimizing the fleet response plan* [Presentation slides]. Retrieved from https://shipbuilders.org/sites/default/files/ADM%20Gortney%20SNA%202014%20Optimizing%20The%20Fleet%20Response%20Plan%20%28Public%20Version%29.pdf

Government Accountability Office (GAO). (1986, January). *Navy maintenance: Costs to overhaul Navy ships at private shipyards* (GAO/NSIAD-86-27). Retrieved from http://www.gao.gov/products/NSIAD-86-27

Government Accountability Office (GAO). (2005, December). *DOD has paid billions in award and incentive fees regardless of acquisition outcome* (GAO-06-66). Retrieved from http://www.gao.gov/products/GAO-06-66

Government Accountability Office (GAO). (2009, May). *Guidance on award-fees has led to better practices but is not consistently applied* (GAO-09-630). Retrieved from http://www.gao.gov/products/GAO-09-630

Government Accountability Office (GAO). (2011, March). *Defense infrastructure: Ability of ship maintenance industrial base to support a nuclear aircraft carrier at Naval Station Mayport* (GAO-11-388R). Retrieved from http://www.gao.gov/assets/100/97346.pdf

Maersk Line, Limited. (2014). Government ship management. Retrieved from http://www.maersklinelimited.com/services/government-ship-management/

McManamon, J. (2009, September 25). *Multi-ship, multi-option (MSMO) program update.* PowerPoint presentation at a briefing at Naval Sea Systems Command, Washington, DC.

Nagle, D. (2002, October 2). *NAVSEA awards multi-ship multi-option contracts for Atlantic fleet ships*. Retrieved from http://www.navy.mil/submit/display.asp?story_id=3820

National Defense Authorization Act for Fiscal Year 2010, Pub. L. No. 111-84, § 1021, 123 Stat. 2190 (2009).

Naval Sea Systems Command (NAVSEA). (n.d.). Surface Maintenance Engineering Planning Program (SURFMEPP). Retrieved from http://www.navsea.navy.mil/teamships/SEA21_SURFMEPP/default.aspx

Naval Sea Systems Command (NAVSEA). (2013, January 29). *Multi-ship, multi-option (MSMO) evolution.* PowerPoint presentation at a briefing at Naval Sea Systems Command, Washington, DC.

Naval Sea Systems Command (NAVSEA). (2014, May 23). *FY15–FY19 third party planning support for DDG 51 and CG 47 class ships.* Retrieved from https://www.fbo.gov/?s=opportunity&mode=form&id=b0c5c706a90010a7899c849cdc18417f&tab=core&_cview=1

Naval Sea Systems Command (NAVSEA). (2015, January 28). *SWRMC MACMO pilot lessons learned.* PowerPoint presentation at a briefing at Admiral Kidd Conference Center, San Diego, CA.

Naval Sea Systems Command (NAVSEA) 21. (2008, August 25). *MSMO Industry Day brief.* PowerPoint presentation at a briefing presented at Naval Sea Systems Command, Washington, DC.

Obama, B. (2009, March). *Government contracting* [Memorandum for the heads of executive departments and agencies]. Retrieved from http://www.gpo.gov/fdsys/pkg/FR-2009-03-06/pdf/E9-4938.pdf

Office of the Chief of Naval Operations (OPNAV). (2010, May 25). *Maintenance policy for United States Navy ships* (OPNAVINST 4700.7L). Retrieved from http://doni.daps.dla.mil/Directives/04000%20Logistical%20Support%20and%20Services/04-700%20General%20Maintenance%20and%20Construction%20Support/4700.7L.pdf

Office of Federal Procurement Policy (OFPP). (1999, February 19). *Best practices for multiple award task and delivery order contracting.* Retrieved from http://www.whitehouse.gov/omb/best_practices_multi_award/

Sembawang Shipyard. (2004, December). Award of breakthrough long-term LNG refit contract from Australia's northwest shelf project. *SEMBship, 30*, 1–3. Retrieved from http://www.sembship.com/newsroom/images/NWS%20LNg%20Award.pdf

Wickenheiser, M. (2014, August 25). *Navy awards General Dynamics Bath Iron Works $100 million contract for LCS planning yard services.* Retrieved from http://www.generaldynamics.com/news/press-releases/detail.cfm?customel_dataPageID_1811=19418

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APPENDIX A. KEY ELEMENTS OF MEASURING CONTRACT PERFORMANCE

1. A multiple incentive type contract containing incentive fee and award fee criteria is appropriate to use in instances where objective criteria exist and the contracting officer and program manager wish to evaluate and incentivize elements of performance that are subjective in nature.
2. A CPAF contract is appropriate for use when it is determined that objective criteria do not exist. In this case, the Head of Contracting Activity (HCA) or a delegated approval authority must sign a determination and finding that "the work to be performed is such that it is neither feasible nor effective to devise predetermined objective incentive targets applicable to cost, technical performance, or schedule."
3. The following award fee parameters shall apply to all award fee provisions:

Rating	Award Fee Pool Earned
Unsatisfactory	0%
Satisfactory	No greater than 50%
Good	50%–75%
Excellent	75%–90%
Outstanding	90%–100%

4. Definitions of Ratings
   a. *Unsatisfactory*—Contractor has failed to meet the basic requirements (minimum essential) of the contract.
   b. *Satisfactory*—Contractor has met the basic requirements of the contract.
   c. *Good*—Contractor has met the basic contract requirements and at least 50% of the award fee criteria established in the award fee plan.
   d. *Excellent*—Contractor has met the basic contract requirements and at least 75% of the award fee criteria.
   e. *Outstanding*—Contractor has met the basic contract requirements and at least 90% of the award fee criteria. (Assad, 2007, pp. 2–3)

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APPENDIX B. DATA ANALYSIS CHARTS INCLUDING USS PORTER

The USS *Porter* maintenance availability was completed under an FFP contract, but was removed from the data analysis due to several factors not normally associated with typical maintenance contracts. The USS *Porter* had significant collision damage, which resulted in non-standard work items and increased growth and new work. The data presented in Figures 7–10 includes the USS *Porter*.

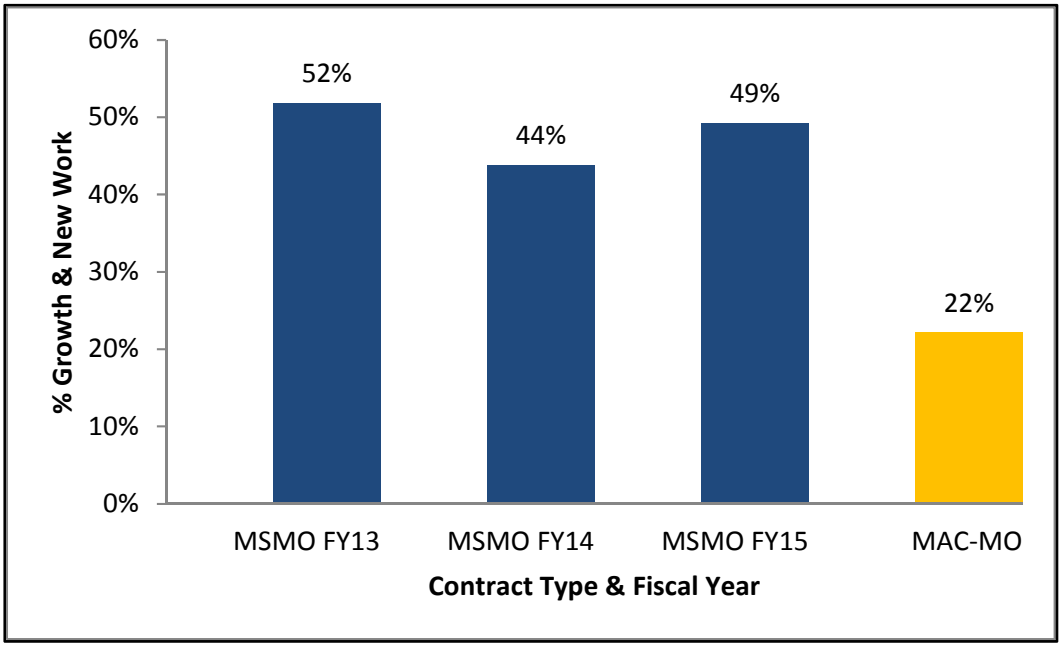

Figure B1. Percentage of Growth and New Work (Including USS *Porter*)

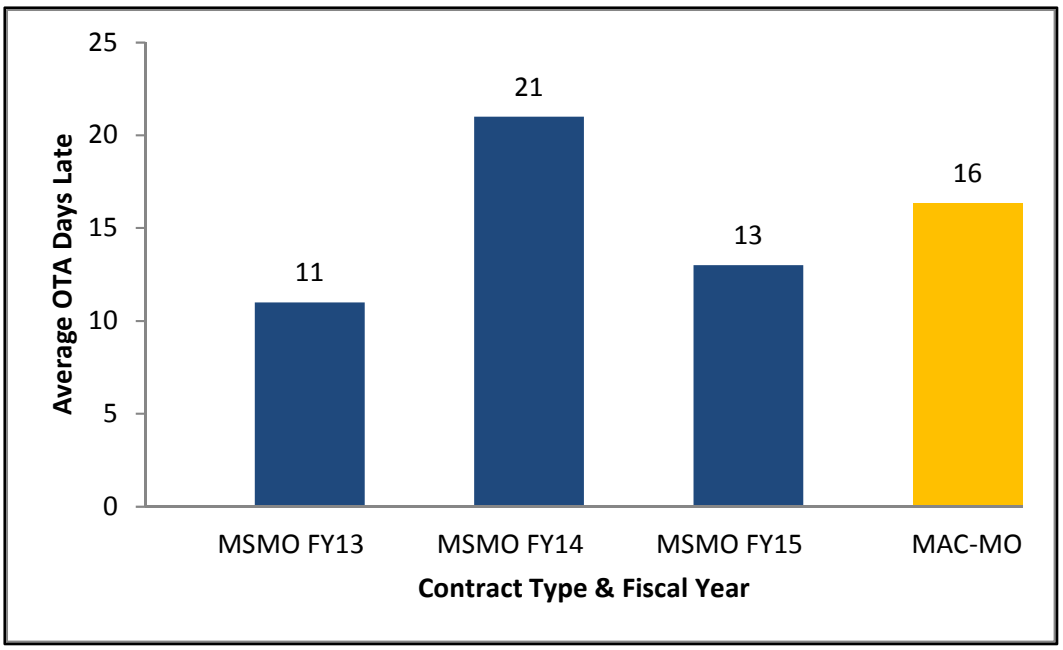

Figure B2. Average OTA Days Late (Including USS *Porter*)

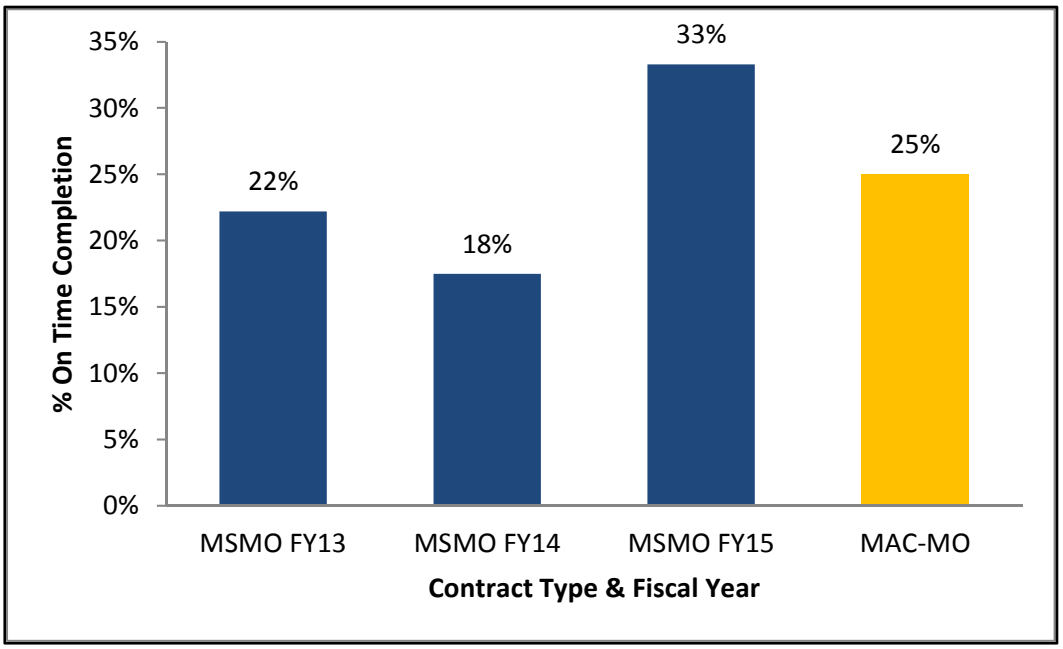

Figure B3. Percentage of OTC (Including USS *Porter*)

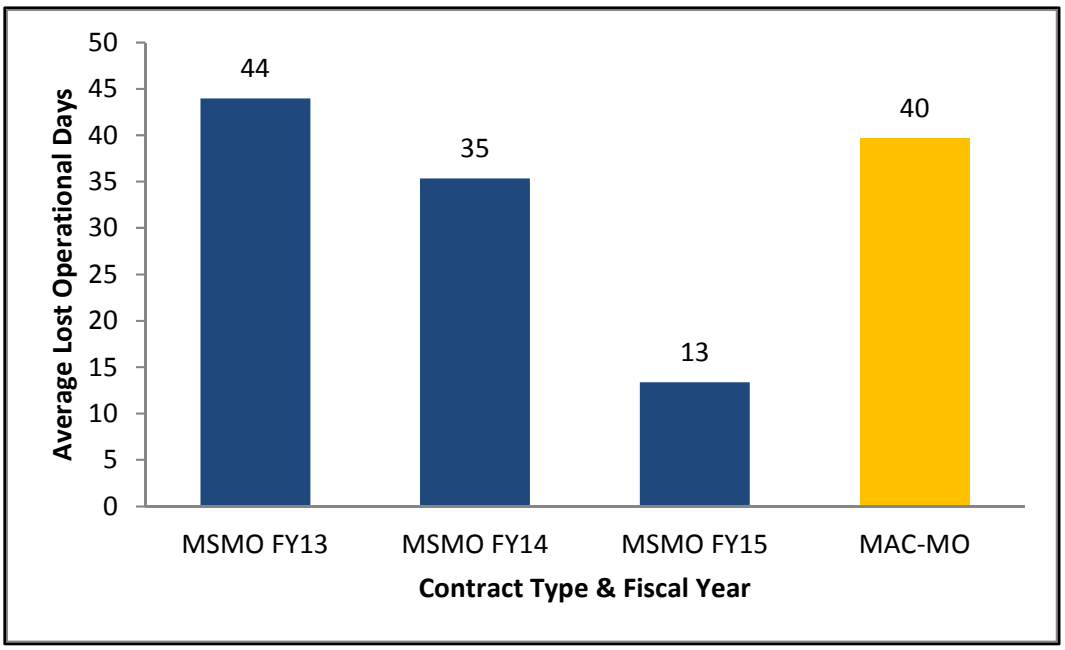

Figure B4. Average LOD (Including USS *Porter*)

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APPENDIX C. PROCESS FOR DETERMINING AWARD FEE AND INCENTIVE FEE AMOUNTS

A. GENERAL PROCESS FOR DETERMINING AWARD FEE AMOUNTS

1. DOD officials provide input on the contractor's performance for an evaluation period that just ended.
2. Program officials compile data and prepare a summary or briefing for the award fee evaluation board.
3. Award fee evaluation board convenes; contractors may submit a self-assessment and brief the board.
4. Award fee evaluation board considers the input; output is a recommended fee rating for the contractor.
5. Fee-determining official (FDO) makes an initial fee determination; contracting officer is notified of determination.
6. Contractor notified of initial determination; contractor has option to appeal the decision.
7. FDO makes final determination.
8. Contracting officer issues final determination to contractor; contract modification authorizing payment is processed. (GAO, 2005, p. 8)

B. GENERAL PROCESS FOR DETERMINING INCENTIVE FEE AMOUNTS

1. At contract completion, DOD contracting officer compares actual cost to the target cost specified in the contract.
2. If actual cost matches target cost, contract is awarded an amount called the target fee or "target profit."
3. If actual cost falls below target cost, a formula is applied with a share ratio that specifies the amount the target fee (or profit) is increased for each dollar below the target cost.
4. If actual cost exceeds target cost, a formula is applied with a share ratio that specifies the amount the target fee (or profit) is reduced for every dollar above target cost.
5. Contract modification processed authorizing payment. (GAO, 2005, p. 9)

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